Error correction

The net result of the sequence

$$(L- R+) F (+, -, or 2) (L+ R-)$$

is to move one of the top-edge cubes to the B face and replace it with one of the bottom-edge cubes. Later on, the top-edge cube is returned to its proper position and orientation. Should you make a mistake or just get lost during one of these lengthy sequences, simply return the wandering top-edge cube to its correct position by doing the following:

1. Hold the cube so that the wandering top-edge cube belongs in the FT position.

2. Move the wandering top-edge cube to position BR by rotating the B face.

3. Do the sequence $(L- R+) F- (L+ R-)$
This will put the top-edge cube into its correct position on the T face. However, the orientation may be wrong. Should this happen, do the following sequence:

Orient top-edge cube:
$(L- R+) F2 (L+ R-) B+ (L- R+) F- (L+ R-)$

All the sequences in step 5, when completed, leave all 8 corner cubes, 4 vertical-edge cubes, and 3 top-edge cubes unmolested, so a serious error is unlikely. Should something disastrous occur, simply see how much of the completed portion of the cube remains correct and go back to the appropriate previous step to correct any errors.

Short cuts

1. Use the reverse of the sequence in step 5B. Remember that bottom-edge cube BF must be correctly positioned.

$$(L- R+) F- (L+ R-) B2$$
$$(L- R+) F- (L+ R-)$$

Determine the changes of the bottom-edge cubes that these sequences cause. Figure out when to use the forward sequence and when to use the reverse sequence. The correct choice will usually eliminate 11 moves.

2. (Expert) It is possible to reduce significantly the number of moves required to accomplish step 5 by positioning and orienting the bottom-edge cubes at the same time. Try to design sequences of moves similar to those in steps 5A and 5F that permute the bottom-edge cubes in different ways. Then learn to recognize the arrangements of the bottom-edge cubes that require these new sequences of moves. You will likely have to recognize more than just three patterns (BC1-BC3) but will complete the puzzle in significantly fewer moves. Even at this late stage, it is still possible to place and orient one of the bottom-edge cubes independently of the other three. One approach to improving step 5 is to correctly position and orient 1 bottom-edge cube in the fastest way and then deal with the remaining 3 as a set.